United States Patent Office

3,348,737

Patented Oct. 24, 1967

3,348,737

DISPENSERS

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Continuation of application Ser. No. 402,229, Oct. 7, 1964. This application May 18, 1966, Ser. No. 550,889

14 Claims. (Cl. 222—58)

This invention relates to beverage dispensers, and more particulary to a system for mixing and dispensing beverages, either carbonated or noncarbonated beverages.

This application is a continuation of co-pending application, Ser. No. 402,229, filed Oct. 7, 1964, and now abandoned.

Among the several objects of this invention may be noted the provision of an improved system of the class described adapted to hold a supply of a beverage ready-mixed for dispensing, and to replenish this supply in response to dispensing of a quantity (a drink) of the beverage by automatically mixing water and syrup to replenish the quantity of beverage dispensed; the provision of such a system adapted for dispensing carbonated and noncarbonated beverages; the provision of such a system adapted for dispensing carbonated beverages of different degrees of carbonation; and the provision of such a system adapted for use either for manual dispensing of beverages or coin-operated vending of beverages. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

FIG. 1 is a diagrammatic representation of a system of this invention; and

FIG. 2 is a wiring diagram.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, first to FIG. 1, there is generally indicated at **1** a water carbonating unit **1**, comprising a carbonator **3**, a water pump **5** and an electric motor **7** for driving the pump. The carbonator **3**, pump **5** and motor **7** are mounted on a platform **9** which is pivoted at **11** in such manner that the weight of the carbonator (and water therein) is brought to bear on a double-throw control switch CS, with the arrangement such that when the carbonator is full of carbonated water, the switch actuator is pressed down to throw the switch on to its upper contact as shown in FIG. 2. When carbonated water in the carbonator drops below a predetermined level, the right end of the platform **9**, as shown in FIG. 1, swings up to release the switch actuator, effecting closure of the switch on to its lower contact as viewed in FIG. 2. This results in operation to bring the level of carbonated water in the carbonator back up to a predetermined level to be maintained therein, as will appear.

Tap water is supplied to the inlet of the pump **5** via a line **13** which includes a filter **15**. A line **17** which includes a solenoid valve **19** connects the outlet of the pump to the carbonator **3**. The arrangement is such that on operation of the pump and with valve **19** open, tap water is pumped into the carbonator **3**. Carbon dioxide gas (CO_2) is supplied to the carbonator from a tank **21** via a line **23** which includes a pressure regulator **25** and a solenoid valve **27**. The CO_2 gas mixes with the water in the carbonator to provide carbonated water having a high carbonation factor, i.e., water having several times its volume of CO_2 gas therein (i.e., high carbonated water). A line **29** extends

from the carbonator to a stabilizer tank **31**. This tank **31** holds a supply of high carbonated water for feeding the system, the supply being replenished as required from time to time by operation of the unit **1**. Tank **31** is a pressure tank, and pressure of CO_2 gas in this tank is utilized to deliver high carbonated water therefrom through a main high carbonated water delivery line **33** as required.

Line **33**, which includes a pressure regulator **35**, extends from the tank **31** to a high carbonated water manifold **37**. As shown in FIG. 1, two carbonated water delivery lines CL1 and CL2 branch off from the manifold **37** for delivery of carbonated water to pressure vessels or mixers M1 and M2. Each of these is adapted to hold a beverage under pressure, and defines a closed mixing chamber or zone in which admixture of the water and syrup may occur. As will appear, each of mixers M1 and M2 is supplied with syrup for admixture with the carbonated water supplied thereto to form a mixed carbonated beverage. Each of lines CL1 and CL2 includes a check valve **39** and a flow control valve **41**. The check valve prevents back flow to the manifold, and the flow control valve provides for a substantially constant rate of flow of carbonated water to the mixer despite variations in pressure in the line upstream from the flow control valve. A third beverage vessel or mixer is indicated at M3. A tap or plain water line PL, including a solenoid valve **43** and a flow control valve **41**, is interconnected between the outlet of pump **5** and mixer M3. A by-pass line **45** including a pressure relief valve **47** interconnects line PL downstream from valve **43** back to the pump inlet.

As shown in FIG. 1, three syrup tanks ST1, ST2 and ST3, for three different flavors, are provided, one for each of the respective mixers M1, M2, M3. These syrup tanks are pressurized from the CO_2 tank **21** via a line **49** including a pressure regulator **51** and having branch connections **53** to the syrup tanks. Syrup supply lines SL1, SL2 and SL3 interconnect the syrup tanks and the respective mixers M1, M2, M3. Each of lines SL1, SL2 and SL3 includes a check valve **55** and a flow control valve **57**. Each check valve **55** prevents back flow in its respective line, and each flow control valve **57** provides for a substantially constant rate of flow of syrup despite variations in the pressure differential across the flow control valve.

Means is provided for adjustably bleeding plain water into the carbonated water delivery lines CL1 and CL2 for adjusting the degree of carbonation of carbonated water delivered via these lines to mixers M1 and M2. In this regard, it will be understood that certain drinks, such as cola drinks, require relatively high carbonated water (e.g., water having from 3.5 to 4.0 times its volume of CO_2 gas therein) and others, such as fruit-flavored drinks, require relatively low carbonated water (e.g., water having from 2.0 to 2.5 times its volume of CO_2 gas therein). Various high carbonated drinks may also require high carbonated water having different high carbonation factors, and various low carbonated drinks may also require low carbonated water having different low carbonation factors. As shown in FIG. 1, this means comprises bleeder lines B1 and B2 interconnecting plain water line PL and lines CL1 and CL2, respectively, each of these bleeder lines including an adjustable needle valve **59** and a check valve **61**. By suitable adjustment of the needle valves B1 and B2, plain water may be allowed to bleed into lines CL1 and CL2 between the check valve **39** and the flow control valve **41** in lines CL1 and CL2 at a rate such as to bring the carbonation factor of carbonated water delivered to mixers M1 and M2 down to a desired value. For example, if carbonated water in tank **31** and manifold **37** has a carbonation factor of 4.2, the needle valve in bleeder B1 may be adjusted to bleed plain water into line CL1 at a relatively low rate such as to bring the